MANAGEMENT AUDIT

OF THE

LIBRARY DEPARTMENT'S

AUTOMATED SYSTEMS

by

Keith Comrie
City Administrative Officer

March, 1981

CITY OF LOS ANGELES
CALIFORNIA

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MAYOR

March 23, 1981

Honorable Tom Bradley, Mayor
Honorable Members of the City Council
Members of the Board of Library Commissioners
Wyman Jones, City Librarian
Wendell J. Meyer, General Manager,
    Data Service Bureau

        Attached for your consideration is the Management Audit
of the Library Department's Automated Systems. This report was
prepared in the normal course of events under the authority of
City Charter Section 53.

        All recommendations are within the authority of the
Library Department and the Data Service Bureau to implement. The
appropriate action therefore is to request the departments to
respond within 90 days regarding their plans to implement the
recommendations, or alternative plans which address the issues
raised in the report.

                        Very truly yours,

                        Keith Comrie
                        City Administrative Officer

KC:DJM:gje

Attachment

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INTRODUCTION

This Management Audit Report is another in a continuing series of reports addressing the City's data processing systems, in this case the Library Department's Automated Technical Systems (ALTS).
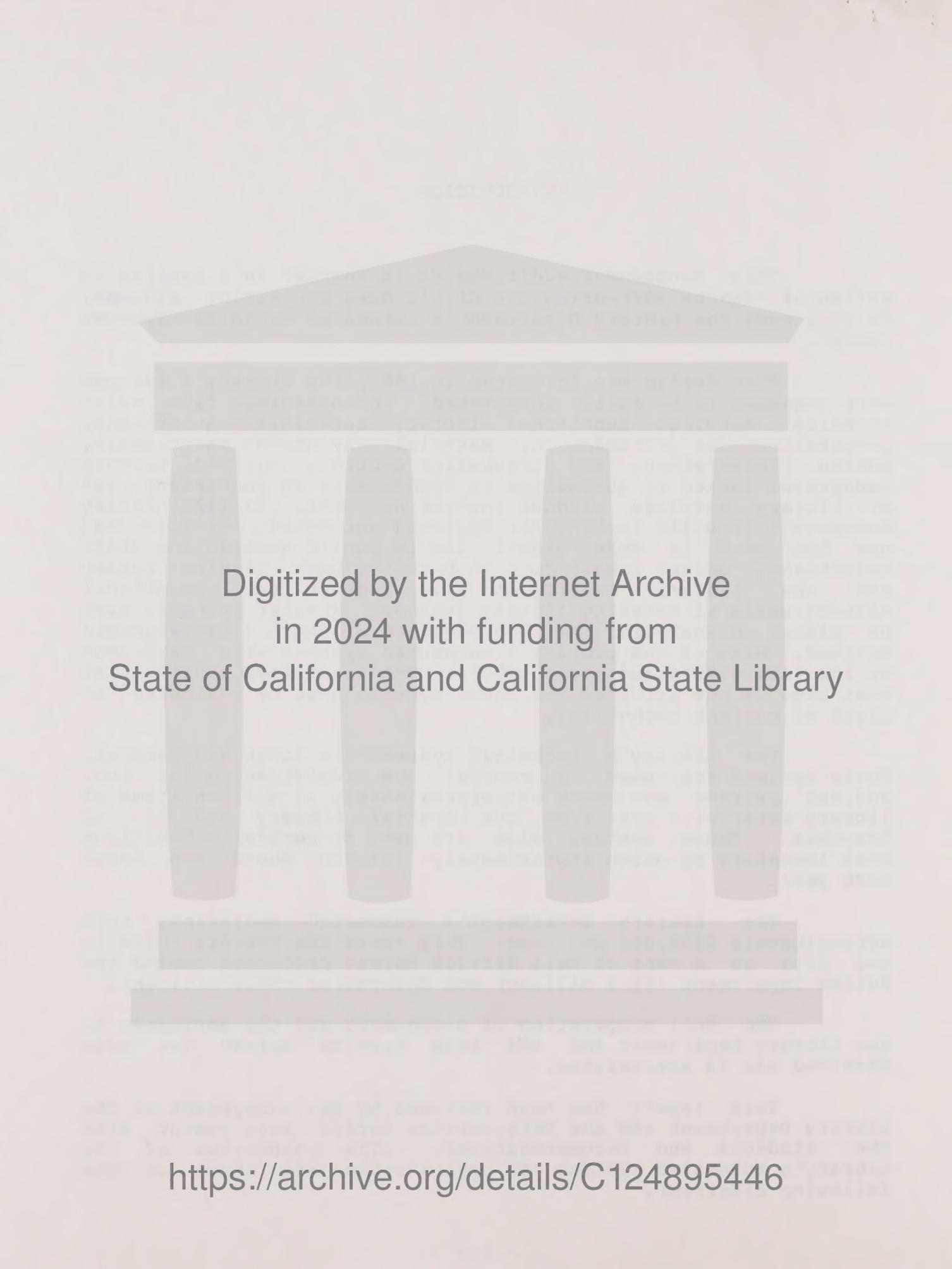
When design was initiated in 1963, the Library's systems were intended to be fully integrated, encompassing five major technical services functions: library materials acquisitions, preparation for circulation, material inventory maintenance, patron registration, and circulation control. In 1963, Library management looked to automation to accommodate an increasing use of library services without increasing staff. In 1980 Library management is still looking for improved automated services and now the need is more urgent due to public demands and staff reductions. Recent budget cuts in both the Data Service Bureau and the Library Department have reduced the operational effectiveness of existing library systems. Greater emphasis must be placed on analyzing cost and benefits of the City's automated systems. Many of the Library's automated systems were developed in the late 1960's and early 1970's. The technology available at that time is now outdated and those systems must be evaluated in light of current technology.

The Library's technical systems are large and complex. These systems are used to control the registration of over 300,000 patrons who check out approximately 11 million items of library material a year from the Central Library and its 62 branches. These systems also are used to control a 5-million book inventory to which approximately 257,000 books are added each year.

The Library Department's automated operations cost approximately $808,000 per year. This ranks the Library third in the City as a user of Data Service Bureau resources behind the Police Department ($2.6 million) and Controller ($1.2 million).

The full cooperation of management and the employees in the Library Department and the Data Service Bureau has been received and is appreciated.

This report has been reviewed by the management of the Library Department and the Data Service Bureau who concur with the findings and recommendations. (The components of the Library's automated systems and organization are shown on the following diagrams).

ACQUISITION OPERATIONS
.Book Ordering
.Fund Accounting
.Serials Processing (TBD)

CATALOGING OPERATIONS
.Book Cards, Pocket and
 Spine Labels Preparation
.Catalog Card preparation
.Bibilographic access to
 Library of Cóngress, and
 RLIN Cataloging Records
.Official Shelf List (IP)

CIRCULATION CONTROL
.Patron Registration
.Circulation Control .
.Overdue Notification
.On-Line Patron Access
 to Cataloging (TBD)

TBD - To be determined
IP - In process of being developed

SUMMARY

In 1963, the Los Angeles Public Library (LAPL) initiated a consultant study to design and develop automated acquisition, cataloging, and circulation functions. To date, portions of these operations are in some state of automation, however, they use outdated technology and do not meet requirements of 1981.

To automate library systems in the 1960's was a pioneering effort and was on the forefront of technology. Library automation was unique and applications were scarce. Resultant development of the Los Angeles library system was costly, with more than $1.5 million committed to the design and development effort.

During the 1970's library automation technology expanded rapidly but the current LAPL automated operations are not reflective of this expanded technology. Extensive card processes are still used in the library systems although the Data Service Bureau has replaced or abandoned card processes in nearly all other City applications. Problems exist today because the card machines used in the circulation system are obsolete and not repairable. A card machine breakdown two years ago caused loss of fines and books due to the lack of parts. During a recent three month period, difficulty was experienced in capturing data for overdue notices. There is no alternative but to work towards replacement of the current circulation process, including computer software and equipment.

Another problem involves the continued use of a stationary card catalog system for bibliographic referencing. Replacement of this system with transportable microfilm catalogs should reduce costs and improve patron service. Los Angeles County and other large library systems have converted to microfilm catalogs with favorable results.

At the present time the Library has no effective way to control the many patrons who abuse the library system. Several patrons owe fines and have overdue materials checked out with a value in excess of $5,000. Lack of an adequate patron overdue system contributes to the approximate $500,000 loss incurred each year in uncollected fines and unreturned material. A current pilot terminal system successfully tried in three branch libraries has greatly reduced flagrant patron abuse by alerting library personnel at the checkout desks. Expansion of this system is recommended.

Many successful vendor-produced library systems are being operated in the U.S.A. using systems which are proved efficient and effective. We do not believe that the in-house capabilities of the City should be used to design and implement state of the art advances in library automation. The current trend in library automation is to spread start-up and operating costs over a broader group of participating libraries, and the proposed entry of LAPL into the 26 member Metropolitan Cooperative Library System could help bring this about.

The LAPL should immediately initiate actions through the Library Systems Committee to obtain proven cost effective vendor library systems to replace its existing automated systems. We support the Library's intention to complete a verified inventory system by 1982 and then select an existing vendor system for acquisitions, cataloging, circulation and automated bibliographic referencing. The current library automated acquisitions, cataloging, and circulation systems should be maintained only until such time as they can be replaced.

We are also recommending, if funds permit, that the Library Department be authorized staff, with systems experience and technical knowledge, to assist in the definition of Library needs and to work with the City's data processing and systems staffs.

The Library Department and the Data Service Bureau have reviewed a draft of this report. A revision was made to allow the Library Systems Steering Committee to set timetables, rather than setting specific dates in this report. Concern was expressed regarding the adequacy of budgeted resources to accomplish the recommendations. Undoubtedly a major revision to the system will have a budgetary impact, both in terms of cost and in savings, added revenue, and other benefits. The Library Systems Plan should address both costs and benefits.

Doubt was expressed by both agencies that an adequate vendor produced circulation system could be found. We are aware of large vendor produced systems in the Chicago and Queens Borough Public Libraries which appear to have potential, but a feasibility analysis beyond the scope of this report is needed. We believe that in-house system design should be a last resort in this case.

RECOMMENDATIONS

That the City Librarian:

1. Initiate regular meetings of the Library Systems Steering Committee to provide direction for planning, developing, and implementing automated library systems. Composition of the Committee should include members from the Library Department, City Administrative Officer, and Data Service Bureau, with the Chair from the Library Department. Services from library consultants must be employed on an as-needed basis.

    The Committee should undertake the following program:

    a. Prepare a Library Systems Plan which should incorporate proposed revisions, tentative time schedules, tentative implementation costs, and system benefits. It is strongly recommended that the plan include provision for a vendor designed automated circulation system if at all feasible.

    b. Implement the revised Inventory System so that it can be interfaced with vendor systems for bibliographic referencing, and forthcoming circulation systems. Insure that Library of Congress standards for machine readable records can be interfaced with the new Inventory System.

    c. Join one of the two national bibliographic service networks, i.e., OCLC-Ohio College Library Center or RLIN-Research Library Information Network.

    d. Evaluate the possibility of sharing library automated systems with other metropolitan libraries in order to reduce capital expenditures and facilitate interlibrary loans.

    e. Replace the current card catalog with microfilm or on-line referencing terminals. Planning for parallel testing of microfilm or on-line referencing terminals should be completed so implementation can begin soon after the inventory system is completed.

    f. Expand the Registration Overdue Validation Information System (ROVIS) to the largest 40-45 branch libraries (those over 100,000 annual circulation) as soon as possible.

g.   Provide additional terminals in cataloging operations to
     do all catalog card production in-house.   .

2.   Request   System   Specialist   capability   in   the   Library
     Department.

It is recommended that the Data Service Bureau:

3.   Design   and   test   in   a   branch library, alternatives to the
     current obsolete 51-column   card   used   to   identify   overdue
     patrons.   Alternatives _should include but not be limited to
     optically scannable transaction data.

4.   Apply additional systems programming resources to the Library
     Department's Automated Systems.

5.   Complete   the programming and implementation phase of the new
     Inventory System.

6.   Add   to   the   ROVIS   software package, alphabetical access to
     patron directory, and ability to register patrons on-line.

FINDINGS

The term "library automation" is generally used to describe a library function which is assisted or controlled by a computer. The most common library functions to which automation has been applied are acquisition, cataloging, circulation, reference, and serials control. Since 1963, the Los Angeles Public Library (LAPL) has attempted to automate portions of these functions with varying degrees of success.

The following briefly describes the LAPL functions and the degree of automation achieved to date.

Acquisitions

Acquisition operations involve those technical and clerical tasks associated with requesting library materials, placing orders with vendors, keeping track of order status, compiling statistics, recording billing data and fund status, and preparing reports. Current automated acquisition operations only apply to hard copy books and not to periodicals and serials, which are not automated.

Acquisition workload statistics indicate that approximately 47,000 book titles and 257,000 volumes are acquired each year. The automation of ordering activities represents the largest charge for computer services incurred for the LAPL by the Data Service Bureau - $394,000 per year.

Purchase orders are computer-produced by the Data Service Bureau listing vendor name and address, fund, purchase order number, vendor number, book identification numbers, number of copies desired, and list price. Computer-produced purchase orders are sent to the Acquisitions Department for routine checking and insertion in vendor envelopes for mailing.

Some of the reports produced from the order cycle are: Agency Open Order Report, Library Fund Status Report, New Titles Received in Library Agency Report, and Master Vendor List.

The Acquisition Department uses VIDEO/370 Data Entry for placing initial orders for library materials with vendors.

Until about October, 1979, the order system had been operating fairly well, but due to a number of factors, there have recently been an increasing number of breakdowns. The system is usually run on the week-end so as not to adversely impact other City systems. Many of the reports provided are not reliable. The Data Service Bureau programmer assigned to the Library system has to work nearly every week-end due to system breakdowns and the complicated processing which only he fully understands. Modifications to the ordering system to make the needed corrections is currently underway and is being given top priority by both the Library Department and the Data Service Bureau.

Because of the high volume of material acquired, automation of acquisition activities is necessary and will greatly reduce the clerical work required in the LAPL. As of June, 1978, approximately 200 libraries in the United States were using automated acquisition systems. The trend is to utilize online systems. Currently vendors are designing software packages that can run on any large computer system without major changes or modification to the hardware. Also the trend is also to revise order information for later use in the Circulation System and Cataloging System instead of recreating it.

Cataloging

Cataloging is the operation of documenting an authoritative record of each item in the library so that it can be easily and quickly located. Currently each of the 62 Los Angeles Public Library (LAPL) branches and 12 Central Library research departments has its inventory listed on two card catalogs. One card catalog, for public use, is sequenced by author, title and subject. The second card catalog, called a shelf list is out of public view and is used by library staff for control purposes. It is sequenced by item location (DEWEY) numbers in the same order that items appear on library shelfs.

In the late sixties, a vendor key-converted the data from the shelf list records into machine readable format. Location and copy data was added through the use of field lists completed by special teams. By 1977, approximately 4 million cards were produced for the cataloged volumes owned by the library.

The objective was to provide the inventory of holdings in printed form so it could be distributed and widely used. Another purpose of the new machine readable records was to make it part of an automated circulation system. The planned circulation system involved capturing patron and item data in machine readable form at the time of the circulation transaction. Several lists were to be produced, which were:

The Official Shelf List - A list in shelf sequence of all titles owned by the Los Angeles Public Library showing holdings. Data elements are: call number (Dewey), author, title, date published, subject heading (maximum of two), Central Library holdings statement showing owning department(s) and copies by copy number/with circulating or reference designation.

Union List - A list of all titles owned by the Library, listed alphabetically by main entry. Entries show copies owned by particular branches. Data elements include: author, title, call number, date published, branch holdings statement (agency code, copy number, reference or circulating designation).

Major problems arose in that the Official Shelf List contained many errors and was never completely edited. As an inventory document it proved nearly valueless.

In 1977, the Library proceeded to edit the inventory of the Central Library subject departments using a large CETA staff.

Each item was physically verified with the Official Shelf List record. Video 370 Data Input was used for making inventory corrections to the data base. Library staff state that by July, 1981, the Central Library's inventory, including an Official Shelf List, will be completed. The task of cleaning up the card catalogs by removing cards for nonexistent books has started. This will be the first complete inventory of the library system since the 1930's.

When completed, the total library inventory, of about 5 million volumes, will be automated in machine readable format. The inventory will then be in a portable and transferable format and will be capable of interfacing with a national bibliographic data base. An automated circulation system will also be possible in that patron information is already in machine readable format.

The Data Service Bureau and Library staff have undertaken a programming project to improve the ordering and cataloging processes which produce inventory information. The revised Library Inventory System will provide regular updates of various inventory files from which regular reports will be produced for each library agency as well as master files. It is expected to be completed and implemented by July, 1981.

It is extremely important that the new LAPL Inventory System be able to adapt to Library of Congress standardization for machine readable records so that vendor systems using those standards can interface with the LAPL data base. Also, future changes to the standardized data base will be easier to convert to newer systems, thus avoiding problems the Library is having today in correcting an inventory that is error ridden.

The Library's Cataloging Section obtains authoritative cataloging information from a Library of Congress microfilm supplied by a vendor. The Section also has an on-line terminal to one of the largest national shared bibliographic cataloging networks called RLIN (Research Libraries Information Network).

RLIN uses the MARC (Machine Readable Cataloging) records provided by the Library of Congress as the foundation of its data base and permits subscribers to enter their own bibliographic records in terminals in their own libraries. Each library can edit information displayed on the screen to fit its own needs.

Another large national cataloging network is OCLC (Ohio College Library Center), which offers on-line bibliographic service to over 1,200 libraries and other users of bibliographic data. OCLC also provides bibliographic catalog cards and has a greater data base of subscriber information available to users.

There is no consensus as to which network is most suitable for the City's needs. The Los Angeles Library has not formally decided to adopt either one, although it is using an RLIN terminal provided on a limited grant basis. Each network is

expanding its automated services. Testing is underway in acquisitions circulation, and automated bibliographic referencing.

Library staff indicates that a decision to adopt a specific system is several years away. Literature research by the Audit Team indicates that delaying a decision for several years may be the best course of action considering unanswered questions in data standards, linking of networks, and independence of library data.

Since the RLIN system can supply bibliographic catalog cards within a week, members of the Cataloging Section stated that using this service with additional on-line terminals would greatly expedite the current manual method of producing cards and would significantly speed up the distribution of new books. The current method of producing catalog cards consists of manually typing masters and then sending them to the City Print Shop for duplication. The Print Shop turnaround time is about six weeks or more, because of the low priority assigned to the jobs and the specialized manual operations involved.

We agree with the Cataloging Section's evaluation of the national bibliographic networks and the need for rapid preparation of catalog cards in order to release books tied up in the warehouse for weeks at a time. See Recommendation No. 1.g.

Patron Registration and Overdue System

The patron registration and the overdue systems comprise essentially one system in the Library Department. The patron registration system maintains a record of each individual or corporate borrower of library materials. When integrated with the overdue system, the patron registration system records the status of borrowers and may, on the basis of data supplied from the overdue system or from input directly to the patron registration system, refuse to issue a new or renewal library card to a previously registered borrower. New registrations are matched against the microfiche patron identification file. In the event the file shows that a prior card was issued and/or fines are due the patron is queried regarding the original card (if still in force) and a disposition made regarding fines due.

The overdue system maintains records of delinquent borrowers, calculates fines and prepares overdue notices. Access to the registration file is by patron identification number (PIN), a unique 8-digit number and patron name. In the overdue system access is by due date and by transaction number, a 4-digit number preprinted on the transaction card, identifying the specific circulation transaction.

The combined patron registration and overdue system issues several reports including a library card, failure to issue (library card) notice, patron directory, pick up list, overdue notices, collection notices, agency registration and error report, agency quarterly report of unreturned items, report of registration activity, analysis of delinquent activity, and zip code list.

Since the consultant's maintenance responsibility was terminated in 1974, the Data Service Bureau has had responsibility for maintenance of the patron registration and overdue system.

Patron registration data conversion is performed under contract. Overdue processing is also carried out under contract. The vendor processes the 51 column cards approximately two weeks after the book is due. The cards are then automatically sorted and a "list" is produced from which overdue notices are prepared. New cards are also prepared at this point by the vendor in order to fill in the "gap" created by the missing overdue cards. The overdue list, together with the 51-column cards are then returned to the Data Service Bureau where overdue notices are prepared and mailed to patrons. See Recommendation No. 3.

Registration Overdue Validation Information System (ROVIS)

The ROVIS project is a pilot on-line patron validation system which was implemented by the Data Service Bureau and the Library in February, 1978. Since its implementation on a pilot basis as an on-line supplement to the batch registration system discussed above, the ROVIS sytem has been operating with five terminals: Central Library-ALTS Office, (1), Granada Hills Branch Library (2), West Los Angeles Branch Library (1), and the Baldwin Hills Branch Library (1). Under this program a cathode ray tube (CRT) terminal allows the library staff to check patron records each time materials are borrowed, thus eliminating the circulation of materials to individuals with delinquent or invalid library cards. This on-line project for validation of library cards is designed to put the entire patron and delinquent files on-line. As patron records are accessed by a unique eight-digit patron identification number (PIN) on the CRT terminal, the library can clear or adjust records by keying appropriate information.

Installation of the CRT terminal in the branch libraries named above has substantially resolved a major problem in manual validation of library cards in that personnel at these branches no longer need to check a 300 plus page microfilm report of patron and delinquent information. The average time required to manually validate a record is 4 to 5 minutes, whereas response time for on-line validation is 2 to 3 seconds. Because of the limited staff available at branch libraries it is impossible to manually validate patron records each time materials are circulated whereas this validation is possible using the CRT terminal.

The CRT terminal installed in the Library Systems office serves a different purpose from those installed in the branch libraries. All system-wide errors generated from registration/overdue documents are corrected by ALTS staff using the CRT terminals. Patron records adjustment documents submitted from Central Library and all branches are keyed by ALTS staff along with a portion of the patron registration update documents. The Library Department reports that it has realized an approximate 50 percent reduction in staff time needed to process corrections to the system documents. Also, by keying documents instead of sending them to an outside vendor, the error rate has been substantially reduced, according to Library staff.

Due to the simplicity of operations as well as program accuracy, there has been a very positive response from library staff working with the on-line validation project. Also, many patrons have indicated to the staff that this type of project seems to be an appropriate way to control circulation. Definitive statistical figures have not been accumulated regarding the effect of the CRT terminals or the operations of

the four branch libraries where they are installed.   Statistical validation of the department's experience to date with the CRT terminals has not been possible because delinquent patrons, upon discovering the use to which these terminals are put, merely avoid the equipped branches and withdraw books from a branch which does not utilize this equipment.

The Library Department has requested expansion of the ROVIS System to include eight additional branches. These include the San Pedro and Wilmington Branches which are isolated from other City libraries and will thus make it difficult for patrons in these areas to avoid validation. Terminals are also planned for installation at the Brentwood, Mar Vista, Palisades, Palms-Rancho Park, and the Robertson branches. Two terminals are also requested for circulation at the Central Library.   Installation at the branches in West Los Angeles would give the Library Department an opportunity to isolate an entire area of the City. The department also has requested authorization to install a terminal at the Hollywood Branch which has an excessive delinquency rate.

From our review of the probable impact of the ROVIS terminals in positive circulation control, we are recommending that these terminals be installed in the 40-45 largest branch libraries at an estimated cost of $110,000 per year.   Additional benefits would include: a reduction in costs for outside vendor support; a decrease in the two- to three-week wait for a patron to receive a permanent library card; and a substantial improvement in the accuracy of data input.

At the present time the LAPL has no effective way of controlling the many patrons who are abusing the library system. Several patrons owe fines and have overdue materials checked out with a value in excess of $5,000. At any one time delinquent patrons total approximately 168,000; the number of unreturned items totals 344,000; fines outstanding total $2,065,000, and the value of unreturned items totals $1,926,000.   Every year approximately $500,000 in fines (including the value of unreturned library materials) are written off as uncollectable.

Library Automation Steering Committee

Throughout the development of automated library systems from the sixties until about 1976, an Automated Library Systems Steering Committee guided development effort, and was composed of members from the Library Department, City Administrative Officer, and Data Services Bureau. Committee meetings lapsed after 1976.

Because of renewed requests for library automation in 1978, the City Administrative Officer instructed his Management Systems Group to review the Library's present information systems

and recommend a course of study to provide an improved information development plan for the Library Department. He also reactivated the Automated Library Systems Steering Committee and assigned it the responsibility to review the entire library automation program and recommend a uniform program of development for the future. Budget restrictions on new systems development and higher priorities given to other City systems efforts, resulted in few meetings.

Problems have existed in coordinating Library automation improvements. There is a lack of coordination in scheduling lead times necessary to purchase equipment, and budget and schedule alterations and improvements. The active participation of the CAO is necessary in order to implement new library systems in the short time span available.

Because of the large investment in automating library systems, the approximately $1 million a year operating costs, and the need to modify and/or replace outdated library systems, regular meetings of the Library Automated Systems Committee are required. Library consultants could be used for further guidance in drafting the design of the new system. See Recommendation No. 1.

The Library does not have appropriately trained information systems personnel to adequately analyze and offer suggestions to improve their operations. Several other City departments are authorized System Specialists for this purpose. Since the Library Department is the third largest user of Data Service Bureau resources, it could profitably utilize a System Specialist to implement automation efforts efficiently and effectively. See Recommendation No. 2.

On February 13, 1980, the Mayor transmitted to the City Council, a request of the Library Department to join the Metropolitan Cooperative Library System (MCLS). MCLS is an association of 26 independent municipal and district libraries within Los Angeles County which have agreed to cooperate in order to provide better library service to the residents of all participants.

The California Library Services Act gives priority in state and federal funding to Cooperative Library Systems. A strong possibility exists for sharing automation costs and benefits under the new arrangement and it should be explored by the Steering Committee. See Recommendation No. 1.d.

System Costs

The following represents the estimated current annual data processing costs for the Library Department's Automated Systems incurred by the Data Service Bureau:

1. Patron Registration, Circulation and Overdue Sections 78-79 Fiscal Year.

Patron Registration	$131,000
ROVIS Terminals	4,000
Circulation Control	80,000
Overdue Notices	102,000

2. Acquisition System   287,000

3. Catalog System   180,000

4. Book Inventory System   24,000

    Total Annual Cost $808,000

Past fiscal years' costs are as follows:

1973-74	$908,000
1974-75	944,000
1975-76	714,000
1976-77	729,000
1977-78	754,000

Serials

Serials are publications such as magazines, which are issued in parts and which are intended to be continued indefinitely. They may be issued at regular or irregular intervals, and the parts may be identified by numbers, dates, or a combination of the two. The control of serials is complex because the range of publication patterns is almost limitless, and because the Library subscriptions number in the thousands.

The LAPL Automated Serials Purchasing System is unimplemented. This system was to control purchasing and open orders, receipt of serial issues and classification of unreceived issues, location of serials being processed, and fund status.

The LAPL Automated Serials Holdings System is also unimplemented. This system was to compile and maintain several lists of serial holdings on the basis of data received through the Serials Purchasing System.

A review of the Serials systems was made five years ago by the LAPL Technical Services Unit and it was decided that automation of Serials was not feasible at that time. The LAPL currently subscribes to Automated Serials purchasing services provided by a vendor.

Reportedly an available vendor serials control system, similar to a system provided for books, has not been developed anywhere in the country, although some research efforts are underway. The Library of Congress is developing a program for Conversion of Serials (CONSER). CONSER will be a national bibliographic machine - readable data base containing cataloging information in serials. Eventually it is hoped that the large vendor bibliographic systems will provide serials services using CONSER.

We agree with the Library's analysis of serial automation. Hopefully, a tested serials system will be available from one of the national library networks.

Conclusion

For the past 15 years, LAPL has attempted to automate the functions of acquisitions, cataloging, circulation, serials control, and has only minimal acceptable automated operations in acquisitions, cataloging, and circulation.

Since the technology for automating these functions is based on what was available in the sixties, more efficient and effective library systems are available today.

A major conclusion of the audit is that the LAPL should not expand or enhance its current automated functions beyond what is necessary to keep them operating for the next three or four years until they are replaced with vendor supplied systems similar to other successful operational systems.

Another major conclusion is that the LAPL should adopt a widely reliable vendor library system instead of attempting to custom design one of its own using Data Service Bureau resources. We do not foresee an adequate commitment of Data Service Bureau resources capable of producing library systems comparable to those provided by vendors.

The Library Department is pursuing the correct course of action by completing a verified inventory by 1981. It will then be able to interface with one of the large national library networks. These networks will hopefully have services in acquisitions, circulations, and automated bibliographic referencing.